

### 3.12 Double Angle Identities

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Use the appropriate sum or difference identity to prove the double-angle identity. Show work!

1)  $\cos 2u = \cos^2 u - \sin^2 u$

1) \_\_\_\_\_

2)  $\cos 2u = 1 - 2\sin^2 u$

2) \_\_\_\_\_

Find all solutions to the equation in the interval  $[0, 2\pi)$ . Show all work!

3)  $\sin 2x = 2 \sin x$

3) \_\_\_\_\_

4)  $\cos 2x = \sin x$

4) \_\_\_\_\_

5)  $\sin 2x - \tan x = 0$

5) \_\_\_\_\_

Rewrite with only  $\sin x$  and  $\cos x$ . Show all work!

6)  $\sin 2x + \cos x$

6) \_\_\_\_\_

7)  $\sin 2x + \cos 2x$

7) \_\_\_\_\_

8)  $\sin 2x + \cos 3x$

8) \_\_\_\_\_

Prove the identity. Show all work!

9)  $\sin 4u = 2 \sin 2u \cos 2u$

9) \_\_\_\_\_

10)  $2 \csc 2x = \csc^2 x \tan x$

10) \_\_\_\_\_

11)  $\sin 3u = (\sin u)(4 \cos^2 u - 1)$

11) \_\_\_\_\_

12)  $\cos 4u = 1 - 8 \sin^2 u \cos^2 u$

12) \_\_\_\_\_

Solve algebraically for exact solutions in the interval  $[0, 2\pi)$ . Show all work!

13)  $\cos 2x + \cos x = 0$

13) \_\_\_\_\_

14)  $\cos x + \cos 3x = 0$

14) \_\_\_\_\_

15)  $\sin 2x + \sin 4x = 0$

15) \_\_\_\_\_

16) BONUS:  $\sin 2x - \cos 3x = 0$

16) \_\_\_\_\_